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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/639,684	08/15/2000	Dennis H. Runnoe	14374.14	4147

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EXAMINER

THOMAS, COURTNEY D

ART UNIT PAPER NUMBER

2882

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/639,684

Applicant(s)

RUNNOE, DENNIS H.

Examiner

Courtney Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 and 28-56 is/are pending in the application.
- 4a) Of the above claim(s) 23-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-22 and 28-56 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group 1, claims 1-22 and 28-56 in Paper No. 15 is acknowledged.

Response to Arguments

2. Applicant's arguments, see p. 14, lines 4-19 (Paper No. 15), filed 6/10/03, with respect to the rejection(s) of claim(s) 1, 5, 28, 29, 30, 44 and 53 under 35 USC § 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of arguments presented in Paper No. 15 (noted above) with respect to the interpretation of recited claim language limitations (i.e. geometrical configuration of included emitter) and previously applied reference: DeCou, Jr. et al. (U.S. Patent 5,264,801).

Claim Objections

3. Claim 18 is objected to because of the following informalities:
4. Claim 18 contains a typo. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims **1-3, 5-7, 11-16, 18, 28-39 and 41-56** are rejected under 35 U.S.C. 102(b) as being anticipated by DeCou, Jr. et al. (U.S. Patent 5,264,801).

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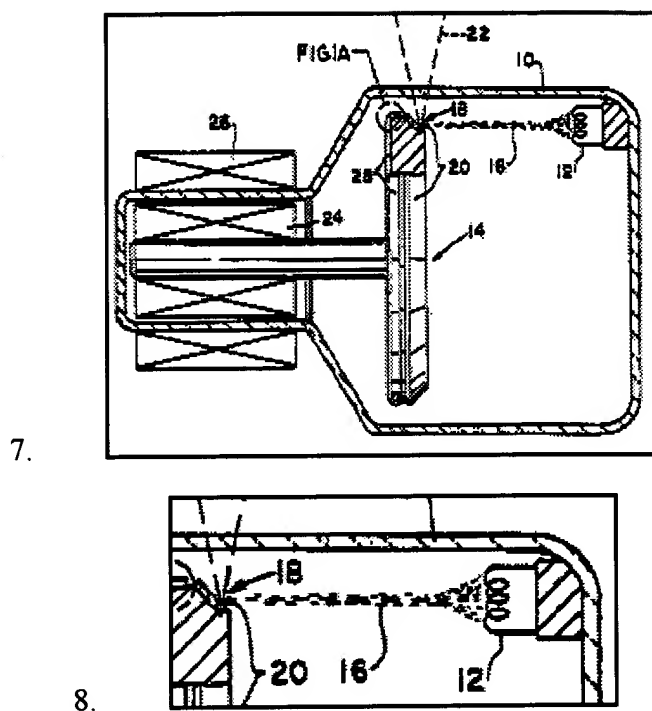


Figure 1 - U.S. Patent 5,264,801 to DeCou, Jr. et al.

9. As per claims 1, 5, 28, 29, 30, 44 and 53, DeCou, Jr. et al. disclose an x-ray device, comprising:

10. (a) a vacuum enclosure (10),

11. (b) an integral cathode disposed in said vacuum enclosure (note: column 1, lines 14-15 and 17-19, column 2, lines 45-47) said integral cathode including an emitter (12) capable of discharging electrons;

12. (c) a power source (not shown - however, examiner notes that the disclosed device could not operate without a power supply. Additionally, Fig.1, illustrates the emission of electrons upon the application of DC potential; see also column 2, lines 61-65) connected to said emitter so that transmission of power from said power source to said emitter causes said emitter to discharge electrons;

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13. (d) a target anode (14) disposed in said vacuum enclosure and having a target surface positioned to receive at least some of the electrons discharged by said emitter;

14. (e) a support cartridge, providing structural support for the emitter (see Fig. 1, above) and

15. (e) wherein the emitter (12) has a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge to a focal spot (see Fig. 1, above; see also column 2, lines 61-65).

16. **As per claims 2 and 6**, DeCou, Jr. et al. disclose an x-ray device wherein the focal spot (18) is located proximate to the target surface of said target anode (14); (see Fig. 1 above).

17. **As per claims 3 and 7**, DeCou, Jr. et al. disclose an x-ray device further comprising a support cartridge (not labeled), the support cartridge receiving the emitter and maintaining the emitter in a desired geometrical configuration.

18. **As per claims 11-16, 18, 31-39, 41-43, 45-52 and 54-56** DeCou, Jr. et al. disclose an x-ray device wherein the support cartridge comprises at least one conductive portion, the electron beam and focal spot being selectively manipulated by the application of a voltage to the at least one conductive portion (i.e. Fig.1), the emitter comprises a plurality of subsidiary emitting portions integral with each other, at least two subsidiary emitting portions not being parallel to each other while cooperating to facilitate the convergence of at least some of the discharged electrons (see Fig. 1 above), wherein the at least two subsidiary portions are integral with each other and are disposed in a substantially "V" shaped configuration (see also Fig. 1 above); wherein a plurality of cut out portions are defined in the emitter, the plurality of cutout portions collectively defining an electrical current path; the emitter substantially comprises a single piece of emissive material, at least one of a subsidiary emitting portion is substantially planar, at least

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one of a subsidiary emitting portions substantially comprise a geometry selected from the group consisting of parabolic and spherical sections (see Fig. 1 above and respective portions of the specification).

Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claims 9, 10 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeCou, Jr. et al. (U.S. Patent 5,264,801).

21. **As per claims 9, 10 and 40** DeCou, Jr. et al. do not explicitly disclose an x-ray device wherein the emitter is substantially composed of a refractory metal or composed of a combination of tungsten and rhenium. One would have been motivated to make such a modification, however, for the purpose of providing an emitter having good emissive characteristics and thermal stability when utilized in elevated temperature environments. Additionally, the selection of suitable/ superior (emitter) materials is a well-known practice/ technique in the x-ray tube art.

22. Claims 4 and 19-22 rejected under 35 U.S.C. 103(a) as being unpatentable over DeCou, Jr. et al. (U.S. Patent 5,264,801) in view of Knudsen et al. U.S. Patent 5,515,413.

23. **As per claims 4 and 19-22**, DeCou, Jr. et al do not explicitly disclose a support cartridge (that) facilitates substantial electrical isolation of the integral cathode. It would have been obvious to a practitioner in the art to provide a support for an integral cathode wherein the

support cartridge was substantially electrically non conductive. One would have been motivated to make such a modification for the purpose of preventing electrical shorting of the device during operation through inadvertent contact with nearby conductive elements. Additionally, the selection of suitable/ superior insulating materials (i.e. ceramics (alumina, zirconia) glass, etc. for use in an elevated temperature environment) is a well-known practice/ technique in the x-ray tube art (see also Knudsen et al. U.S. Patent 5,515,413 - column 2, lines 32-61).

24. Claim 17 rejected under 35 U.S.C. 103(a) as being unpatentable over DeCou, Jr. et al. (U.S. Patent 5,264,801) in view of Reinhold (U.S. Patent 4,573,186).

25. **As per claim 17**, DeCou, Jr. et al do not explicitly disclose an apparatus wherein the emitter is substantially bowl shaped.

26. Reinhold discloses an apparatus wherein the emitter (3) is substantially bowl shaped (see Fig. 2)

27. It would have been obvious to modify the apparatus of DeCou, Jr. et al. such that it incorporated an emitter that is essentially bowl shaped. One would have been motivated to make such a modification so that electron emission is finely focused, due to the shape of the emitter thereby resulting in an increase in the resolving power of an X-ray apparatus as suggested by Reinhold (see abstract; also column 1, lines 15-26).

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Allowable Subject Matter

28. Claims 8 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

29. **As per claim 8**, the examiner found no reference in the prior art that disclosed or made obvious an apparatus wherein the predetermined geometrical configuration provides an emitter having a cross section substantially in the shape of an arc so that a concave side of the emitter is directed toward the target surface of a target anode.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Courtney Thomas whose telephone number is (703) 306-0473. The examiner can normally be reached on M - F (9 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308 4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

Courtney Thomas

July 31, 2003


DAVID V. BRUCE
PRIMARY EXAMINER